FlyBy Math™ Alignment
Illinois Learning Standards
Stages F, G, H - Mathematics (Grades 5, 6, 7, 8, 9)

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

A. Measure and compare quantities using appropriate units, instruments, and methods. . ***(Performance and conversion of measurements)***

7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.

Descriptor – Stage G	***FlyBy Math™* Activities**
2. Make simple measurements to determine indirect measures (e.g. determining the height of a flagpole using its shadow and similar right triangles)	--Calculate and measure the position and time of simulation aircraft. Represent that motion using tables, graphs, equations, and experimentation. --Conduct simulation and measurement for several aircraft conflict problems.

B. Estimate measurements and determine acceptable levels of accuracy. ***(Estimation)***

7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.

Descriptor – Stage F	***FlyBy Math™* Activities**
1. Estimate distance, weight, temperature, and elapsed time using reasonable units and with acceptable levels of accuracy.	--Calculate and measure the position and time of simulation aircraft. Represent that motion using tables, graphs, equations, and experimentation.

C. Select and use appropriate technology, instruments, and formulas to solve problems, interpret results, and communicate findings. ***(Progression from selection of appropriate tools and methods to application of measurements to solve problems)***

7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.

Descriptor – Stage G	***FlyBy Math™* Activities**
4. Solve simple problems involving rate, time, and distance.	-- Use the distance-rate-time formula to predict and analyze aircraft conflicts. --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
Descriptor – Stage H	***FlyBy Math™* Activities**
1. Solve simple problems involving rates and other derived measurements such as velocity and density.	--Use the distance-rate-time formula to predict and analyze aircraft conflicts. --Use tables, bar graphs, line graphs, a Cartesian

	coordinate system, and equations to model aircraft conflicts and predict outcomes.

State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results	
A. Describe numerical relationships using variables and patterns. *(Representations and algebraic manipulations)*	
8.A.3b Solve problems using linear expressions, equations and inequalities.	
	***FlyBy Math™* Activities** --Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. --Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
B. Interpret and describe numerical relationships using tables, graphs, and symbols. *(Connections of representations including the rate of change)*	
8.B.3 Use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns.	
Descriptor – Stage F 2. Create a table of values that satisfy a simple linear equation and plot the points on the Cartesian plane. 3. Describe, verbally, symbolically, and graphically, a simple relationship presented by a set of ordered pairs of numbers.	***FlyBy Math™* Activities** --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
Descriptor – Stage H 1. Graph linear equations and inequalities on the Cartesian plane. 2. Graph a set of points and describe the relationship as linear or nonlinear. 5. Determine the slope of a line from a graph.	***FlyBy Math™* Activities** --Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system. --Interpret the slope of a line in the context of a distance-rate-time problem.

D. Use algebraic concepts and procedures to represent and solve problems. *(Connection of 8A, 8B, 8C to solve problems)*	
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	
Descriptor – **Stage F** 1. Create, model, and solve algebraic equations using concrete models.	***FlyBy Math™* Activities** --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
Descriptor – Stage G 1. Solve simple linear equations, including direct variation, with integral coefficients using algebraic or graphical representations.	***FlyBy Math™* Activities** --Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
Descriptor – Stage H 1. Solve algebraic equations or word problems that involve linear equations or inequalities using algebraic or graphical representations.	***FlyBy Math™* Activities** --Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
8.D.3b Propose and solve problems using proportions, formulas and linear functions.	
Descriptor – **Stage F** 1. Create, model, and solve algebraic equations using concrete models.	***FlyBy Math™* Activities** --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. -- Use the distance-rate-time formula to predict and analyze aircraft conflicts.
Descriptor – Stage G 1. Solve simple linear equations, including direct variation, with integral coefficients using algebraic or graphical representations.	***FlyBy Math™* Activities** --Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. -- Use the distance-rate-time formula to predict and analyze aircraft conflicts.

Descriptor – Stage H	*FlyBy Math™* Activities
1. Solve algebraic equations or word problems that involve linear equations or inequalities using algebraic or graphical representations.	--Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. -- Use the distance-rate-time formula to predict and analyze aircraft conflicts.

State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

A. Organize, describe and make predictions from existing data. *(Data analysis)*

10.A.3a Construct, read and interpret tables, graphs (including circle graphs) and charts to organize and represent data.

Descriptor – Stage F	*FlyBy Math™* Activities
1. Construct, read, interpret, infer, predict, draw conclusions, and evaluate data from various displays, including circle graphs.	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
Descriptor – Stage G	***FlyBy Math™* Activities**
1. Construct, read, interpret, infer, predict, draw conclusions, and evaluate data from various displays, including box and whisker plots.	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
Descriptor – Stage H	***FlyBy Math™* Activities**
1. Construct, read, interpret, infer, predict, draw conclusions, and evaluate data from various displays, including histograms and scatter plots.	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.

B. Formulate questions, design data collection methods, gather and analyze data and communicate findings. *(Data Collection)*	
10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	
Descriptor – Stage F 1. Gather data by conducting simple simulations. 2. Collect data over time with or without technology.	***FlyBy Math™* Activities** Conduct simulation and measurement for several aircraft conflict problems.
Descriptor – Stage G 1. Select and use appropriate data gathering techniques.	***FlyBy Math™* Activities** Conduct simulation and measurement for several aircraft conflict problems.
Descriptor – Stage H 1. Formulate a question, design a study to answer the question, and collect data.	***FlyBy Math™* Activities** Conduct simulation and measurement for several aircraft conflict problems.